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## Environmental Impact Assessment in Construction Activities for Dahab Tower Building Mogadishu

Abdullahi Mohamed Sheikh Ali<sup>1\*</sup>, Abdikafi Elmi Abdishakur<sup>1</sup>, Abdifitah M Adan<sup>2</sup>, Ahmed Mohamed Hassan<sup>1</sup>

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### ABSTRACT

The degree of knowledge and understanding of construction stakeholders, particularly project managers, about the environmental impacts of construction processes has to be improved because construction is one of the major causes of environmental pollution worldwide. This study aims to assess the most common environmental impacts of the Dahab Tower building project in Mogadishu. To achieve this objective, this study's evaluation of the project's impact has used a checklist matrix. Environmental risks were discovered to be present in the project, including waste generation (municipal, construction, and demolition wastes); changes in the characteristics of the soil; and the emission of air pollutants, among others. These risks are similar to those that are present in the majority of infrastructure and construction projects. Through the suggested mitigation strategies, these risks may be effectively controlled and monitored through preferred mitigation steps.

### INTRODUCTION

A project's possible impacts, both positive and negative, on the biophysical and financial conditions are identified and assessed systematically through the environmental impact assessment (EIA). Along with efforts to improve good outcomes, it also identifies remedial measures that need to be performed to prevent, limit, or decrease unfavorable impacts. The EIA is not a fully direct procedure; rather, several phases are finished concurrently, and the assumptions and findings are reviewed and changed as the project advances. (<http://www.epa.ie/monitoringassessment/cia/>)

All across the world, environmental protection is of utmost importance (Tse & Raymond, 2001). Construction is the sector of the economy that contributes the most to environmental pollution when compared to other sectors. (Shen *et al.*, 2005). Constructions have a significant direct and indirect impact on the environment during construction and maintenance. (Levin, 1997). Noise, toxic fumes, dust, and solid and liquid waste are all common forms of construction related pollution. (Chen *et al.*, 2000). This problem has pushed a variety of construction sector companies to develop environmental management systems to reduce the negative effects of their operations. (Lam *et al.*, 2011). The idea of sustainable development will progress primarily as a result of greater understanding and awareness. (Zainul Abidin, 2010). Developed nations, professional associations, and private organizations have implemented a variety of initiatives to advance the knowledge and abilities of construction professionals and to encourage the use of sustainable practices in construction projects. (Zainul Abidin, 2010). Unfortunately, the construction sector is still learning about the sustainability movement. There is no comprehensive source available in Somalia that can train

construction professionals about the most dangerous environmental effects resulting from development. To determine the most common environmental impacts according to their strength of influence, this study examined their frequency and consequences.

### Environmental Impacts of Construction

Environmental management systems will operate more efficiently by more precisely identifying the main environmental consequences of the construction process. The environmental performance of construction projects and sites will also increase as a result of the environmental effects of the building being predicted before the construction stage. By identifying the pertinent environmental implications, it will be easier to evaluate alternative on-site mitigation solutions. (Gangoells *et al.*, 2011). The environment, natural resources, and public impact are among the environmental effects of building activities (Li *et al.*, 2010).

### Environmental Impacts

The construction process still has a substantial negative impact on the environment, presenting a risk to both humans and ecosystems through waste, noise, dust, and hazardous substances. (Chen *et al.*, 2004). The ecosystem's impact on construction has become more significant as more new buildings are being developed. Biological Resources: Various natural resources, including "energy," "land," "materials," and "water," are needed throughout the typical building process. (Shen *et al.*, 2005). Additionally, using natural resources like electricity and/or diesel fuel is typically required while operating construction equipment. Since raw materials need to be harvested and transported using a lot of energy, the construction industry is to blame for utilizing a lot of

<sup>1</sup> Department of Civil Engineering, College of Engineering and Technology, Abarar University, km6 Hodan district, Mogadishu, Somalia

<sup>2</sup> Michigan State University, Room no: 1215 EB building Shaw Lane, East Lansing, Michigan, United states

\*Corresponding author's e-mail: [marwaanka9@gmail.com](mailto:marwaanka9@gmail.com)

natural resources and causing a lot of pollution. (Li *et al.*, 2010; Morel *et al.*, 2001).

**Public perception impact**

The majority of construction jobs are located in populous regions. Due to the dust, vibrations, and noise created by various building activities, such as excavation, people who live close to or next to construction sites are more prone to have negative health impacts. (Li *et al.*, 2010).

**MATERIALS AND METHODS**

**The Field of Study**

Dahab Tower is a new High rise mixed-use building project by Dahab Real Estate a Subsidiary Company of Dahabshil Group, The building consists of a shopping



Source: skyscraperity

mall, office apartments, residential apartments, a gym, a sauna, a saloon, a reserved floor for prayers (Mosque) and a secure parking yard. Building location Hodan district, km6, Digfeer road beside Abdullahi Isse mosque.

**Methodology of the Study**

The impact of building construction projects has been assessed using a checklist matrix. Comprehensive field inspections and surveys to back it up. The EIA approach were used by the researcher in this investigation (scoping, scoping, impact analysis, and impact mitigation measures) with the use of on site inspections and a variety of building construction project criteria, the EIA of construction projects in the study region was critically examined.

**The Review Checklist Consists of:**

- Describe the project.
- Comparison of alternatives
- Description of the environment that the project is anticipated to have an impact on
- A summary of the project’s potential substantial

consequences

- Outline of mitigation measures
- Non technical summary

**RESULTS AND DISCUSSION**

**Environmental Screening**

To ascertain if and at which level of review an EIA assessment is required for this project, an environmental screening was conducted.

**Screening**

- Creation of Employment and Business Opportunities
- Environmental opportunities
- The market for goods and services
- Aesthetic Enhancements
- Loss of vegetation
- Change in Surface and Sub-Surface Hydrology
- Change the soil characteristics
- Will cause air pollution
- will generate noise pollution
- Cause Heavy Traffic
- Generate solid and liquid wastes to the environment’
- Security threats

**Category A**

To complete this project, the Environmental Impact Assessment is required.

**Environmental Scoping**

The physical, natural, ecological, social, economic, and cultural components of environmental issues were separated apart. Impacts were further divided into short-term and long-term effects.

**Long List Impact**

- Aesthetic Enhancements
- Change in Surface and SubSurface Hydrology
- Change the soil characteristics
- Loss of vegetation
- Generate solid and liquid wastes in the environment
- Security threats

**Shortlist Impact**

- Creation Of Employment And Business
- Environmental opportunities
- The market for goods and services
- air pollutions
- noise pollutions
- Heavy Traffic

**Table 1:** Impact Analysis: Checklist Method

Aspects of Eia	Checklist Questions Will the Project	Yes	No
Social economic	Creation of Employment and Business Opportunities		No
Social economic	Environmental Opportunities		No
Social economic	The Market for Goods and Services		No
Environmental	Losso of Vegetation	Yes	

Environmental	Change on Surface and Sub Surface Hydrology	Yes	
Environmental	Change the Soil Characteristics	Yes	
Environmental	Will Cause Air Pollution	Yes	
Environmental	Will Generate Noise Pollution	Yes	
Environmental	Cause Heavy Traffic	Yes	
Environmental	Generate Solid and Liquid Wastes to The Environment	Yes	
People	Security Threats	Yes	

Yes= Highly Adverse, No = Beneficial

**Table 2:** Impact Mitigation Measures

Probable Impact	Preferred Mitigation Steps
Vegetation Loss	<ul style="list-style-type: none"> <li>• Upon completion of development, indigenous plants will be used for landscaping</li> <li>• Maintaining beautiful gardens, and terraces, and managing the gardens' vegetation and conservation</li> <li>• Removing vegetation exclusively in designated locations for building and in regions where no clearing will take place</li> </ul>
Changes to the Hydrology of the Surface and Subsurface.	<ul style="list-style-type: none"> <li>• According to the drainage system's design, the surface flow should be correctly drained during construction into the public drains provided to prevent flooding on the site</li> <li>• Drainage channels should be installed in all places that create or receive surface water, including parking areas, highways, and the space surrounding building blocks on rooftops</li> <li>• The channels should be covered with gratings or other suitable and approved materials to prevent accidents and the entry of dust that would cause the flow of run off.</li> <li>• Peak volumes should be considered while designing the channels, such as times of the year with heavy rainfall, which is unusual in the project location but should be prepared for. They should not be filled at any time due to the potential for strong downpours</li> <li>• To ensure the safe final disposal of run-off and surface water, the drainage channels must be self-cleaning, which means they must have an appropriate gradient</li> <li>• Stormwater generated by roof catchments must be gathered, stored, and used for a variety of household functions, including routine cleaning. Less runoff will reach drainage channels as a consequence</li> <li>• It is preferable to cover the side walkways, driveways, and other open areas with recycled materials, such as carbon, to promote water recharging and reduce run-off volume</li> </ul>
Alterations in Soil Properties	<ul style="list-style-type: none"> <li>• Sprinkling water on the surface to prevent the rise of dust establishes specialized trucking paths</li> <li>• Making sure there is enough space for water to percolate normally</li> <li>• Contamination from construction waste may be avoided by establishing designated locations for waste collection, sorting, and transportation. Drainage structures must be installed and configured correctly to ensure their effectiveness</li> <li>• Installing Cascades will reduce the impact of water entering sewers</li> <li>• Controlling and ensuring the supervision of the excavation activities</li> <li>• Compacting areas with loose soil</li> <li>• Landscaping</li> <li>• Constructing structures to prevent soil erosion in the site's steeper parts and managing activities during the wet season</li> </ul>
Pollutants in the Air Emissions	<ul style="list-style-type: none"> <li>• To stop dust from rising, water should be sprinkled on the ground before excavation and at regular intervals while work is being done</li> <li>• Placing dust proof nets around the structures being built</li> <li>• Using fossil fuel burners equipped with low emission machinery</li> <li>• Controlling the operation and speed of construction trucks</li> <li>• Frequent servicing and repair of machinery</li> <li>• Use of clean fuels, such as sulphureted and unleaded fuels</li> <li>• Inform and raise awareness of emission reduction techniques among construction workers</li> </ul>



<p>Generation of Noise</p>	<ul style="list-style-type: none"> <li>• Using tools with noise canceling features</li> <li>• Placing signage around the area to alert visitors to the noise levels</li> <li>• Equipment maintenance is necessary to keep it functional and effective</li> <li>• Construction work should only be done at a specified time, often beginning around 800 hrs. To 1700 hrs. Using tools with noise canceling features</li> <li>• The equipment involved shouldn't unnecessarily be horned</li> <li>• Providing informational billboards on the activities and timings at the site's entrances</li> </ul>
<p>Increased Heavy Traffic</p>	<ul style="list-style-type: none"> <li>• Putting up signs around the area warning other cars of the excessive traffic and setting a speed limit there</li> <li>• Ensuring that the project's drivers comply with the speed limits</li> <li>• Guaranteeing that the construction does not occupy the road reserves and complying with the requirements for traffic and land delineation</li> </ul>
<p>Generation of Waste</p>	<ul style="list-style-type: none"> <li>• Developing and carrying out a waste management strategy</li> <li>• Utilizing waste reduction strategies such as bulk purchasing, eating at places that serve pre-processed food, etc <ul style="list-style-type: none"> <li>• Identifying all waste sources, delegating control of waste management, and ensuring that wastes are handled by those who hold the necessary permits</li> <li>• Providing the necessary infrastructure to collect, separate, and safely dispose of waste</li> <li>• Establishing waste collection zones with equipment for managing wastes and properly identified facilities like colored bins. Plastics, rubber, organics, glass, paper, electrical equipment, and other materials should each have a designated container</li> <li>• Ensuring that dustbins are regularly cleaned and sterilized and that all waste is disposed of by minimal requirements and in the appropriate place</li> <li>• Regulation, reduction, reuse, recycling, recovery, rethinking, and renovation alternatives are assessed and established</li> <li>• Establishing the required storage facilities for commodities and chemicals, and controlling access to them</li> <li>• Bins must be shielded from the rain and animals</li> </ul> </li> </ul>
<p>Security Threats</p>	<ul style="list-style-type: none"> <li>• Putting in place security guards or a professional security firm, and inspecting all vehicles and people entering the project</li> <li>• CCTV cameras are used to keep an eye on on site security</li> <li>• Collaborating with the national police on security related concerns</li> <li>• Setting up emergency response and preparation protocols and placing alarms throughout the project</li> </ul>

**RESULT**

Maximum Number is (YES) so it is a highly adverse impact.

To assess if the building project had a positive or negative influence on the environment, researchers purposefully select Yes and No along with suggested experts. When the researchers realized the effects the building project had on the environment, they suggested taking the aforementioned procedures to mitigate the impact on the environment.

**CONCLUSION**

It is clear from the analysis that the planned project will have both favorable and unfavorable effects. The majority of the negative effects are viewed as insignificant in comparison to the anticipated short and longterm advantages that would result from the proposed project's formation and operation if it is built and run taking into consideration the suggested mitigating measures. During each of its phases, the project will have several beneficial economic effects, including the creation of employment

opportunities the development of a market for products and services, and the emergence of new business possibilities for a range of organizations and people. These will help Mogadishu become a metropolitan city by improving the quality and availability of the city's infrastructure, which will help the vision for the next 20 years be realized. The project will still raise environmental issues such as waste generation (including municipal, construction, and demolition wastes), alterations to the soil's physical characteristics, and the emission of air pollutants, which are issues that are common to building and infrastructure projects. These risks might be adequately managed and tracked by using the indicated mitigation techniques.

**RECOMMENDATIONS**

Among the recommendations are efficient waste management, the use of safety nets and sheets, the installation of warning signs for the protection of the workers, the provision of necessary personal protective equipment for them, and the use of manual labor to lower noise and air pollution.

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